What is claimed is:

1. A gain control method for acoustic echo cancellation and suppression for use with a full duplex voice terminal receiving a far-end signal from a far-end voice terminal and sending a transmit signal to the far-end voice terminal, the full duplex voice terminal having an adaptive filter, a speaker and a microphone, the method comprising:

playing the far-end signal at the speaker;

receiving an echo signal that is acoustically coupled from the speaker to the microphone, wherein the echo signal is a portion of the far-end signal played at the speaker;

filtering the far-end signal by the adaptive filter to generate a filtered signal;

calculating an error signal, wherein the error signal is the difference between the echo signal minus the filtered signal;

calculating an attenuation factor from the far-end signal, the filtered signal, the and the error signal, wherein the attenuation factor is between a predetermined upper limit and a predetermined lower limit; and

calculating the transmit signal, wherein the transmit signal is the product of the attenuation factor times the error signal.

2. The gain control method of claim 1 wherein receiving an echo signal comprises:

receiving an analog echo signal from the microphone; and

digitizing the analog echo signal at a predetermined rate of samples per second, wherein the rate of samples for second is the same rate of samples per second as the received far-end signal.

3. The gain control method of claim 1, wherein calculating an attenuation factor further comprises:

calculating a suppression value from the far-end signal, the filtered signal, the error signal and a predetermined silence value;

smoothing the suppression value to produce a smoothed suppression value; and

deriving the attenuation factor from the smoothed suppression value, wherein the attenuation factor is between the predetermined upper limit and the predetermined lower limit.

4. The method of claim 3 wherein calculating an attenuation factor further comprises:

converting the suppression value to a linear value;

applying a predetermined smoothing factor to the linear value to produce a smoothed linear value; and

determining the attenuation factor between the predetermined upper limit and the predetermined lower limit, wherein when the smoothed linear value is less than the predetermined lower limit the attenuation factor is equal to the predetermined lower limit and when the smoothed linear value is greater than the predetermined upper limit the attenuation factor is equal to the predetermined upper limit and when the smoothed linear value is between the predetermined

upper limit and the predetermined lower limit, the attenuation factor is equal to the smoothed linear value.

5. The gain control method of claim 3, wherein calculating a suppression value further comprises:

calculating a far-end power from the far-end signal;

calculating a normalized far-end power as the difference between the predetermined silence power minus the far-end power;

calculating an error power from the error signal;

calculating a filtered power from the filtered signal;

calculating a normalized near-end power as the difference between the error power minus the filtered power;

locating a first weighted value and a second weighted value from a table of two or more predetermined first weighted values and two or more predetermined second weighted values, wherein the normalized near-end power points to the corresponding first weighted value and the corresponding second weighted; and

calculating the suppression value as the sum of the product of the first weighted value times the normalized far-end power plus the product of the second weighted value times the normalized near-end power.

6. A method of calculating an attenuation factor for use with a full duplex voice terminal comprising an echo canceller having an adaptive filter to filter a far-end signal and produce a filtered signal, and an echo suppressor comprising a processor, a speaker and a microphone that receives an acoustically coupled echo signal, the method comprising:

subtracting the filtered signal from the acoustically coupled echo signal to produce an error signal;

processing the far-end signal, the filtered signal, and the error signal to compute a far-end power, a filtered power, and an error power respectively;

calculating a suppression value as the sum of a weighted difference between a predetermined silence power minus the far-end power plus a weighted difference between the error power minus the filtered power;

converting the suppression value to a linear value; and

determining the attenuation factor between an upper limit and a lower limit, wherein the attenuation factor is the upper limit when the linear value is greater than the upper limit, is the lower limit when the linear value is less than the lower limit and is the linear value when the linear value is between the upper limit and the lower limit.

7. The method of claim 6 further comprising:

applying a predetermined smoothing factor to the linear value to produce a smoothed linear value, wherein the smoothed linear value is used to determine the attenuation factor.

8. The method of claim 6 wherein calculating a suppression value further comprises:

calculating a normalized near-end power as the error power minus the filtered power;

calculating a normalized far-end power as the predetermined silence power minus the far-end power;

using the normalized near-end power to locate a first weighted value from two or more first weighted values and a second weighted value from two or more second weighted values; and

calculating the suppression value as the sum of the product of the first weighted value times the normalized far-end power plus the product of the second weighted value times the normalized near-end power.

9. A gain control method for acoustic echo cancellation and suppression for use with a full duplex voice terminal having a speaker and a microphone, wherein the full duplex voice terminal receives a far-end signal x[n] from a far-end voice terminal and sends a transmit signal t[n] to the far-end voice terminal, the method comprising:

filtering the far-end signal x[n] to produce a filtered signal y[n];

receiving an analog echo signal from the microphone;

digitizing the analog echo signal at a predetermined rate of samples per second to produce an echo signal d[n];

calculating an error signal e[n] according to e[n] = d[n] – y[n];

processing the far-end signal x[n], the filtered signal y[n], the echo signal d[n] and the error signal e[n] to calculate respective far-end power P_x, filtered power P_y, echo power P_d, and error power P_e;

calculating a normalized far-end power $P_{far\text{-}end}$ according to $P_{far\text{-}end} = P_s - P_x$ where P_s is a predetermined silence power;

calculating a normalized near-end power $P_{near\text{-}end}$ according to $P_{near\text{-}end} = P_e - P_y$;

locating a first weight W_1 and a second weight W_2 from a table having two or more first weights W_1 and two or more corresponding second weights W_2, wherein the one of the two or more first weights W_1 and the one of the two or more second weights W_2 is pointed to by $P_{near\text{-}end}$;

calculating a suppression value A according to $A = W_1 P_{far\text{-}end} + W_2 P_{near\text{-}end}$;

converting the suppression value A to a linear suppression value k_{inst};

applying a predetermined smoothing factor to the linear suppression value k_{inst} to produce a smoothed linear suppression value k_{smooth};

determining an attenuation factor k between an upper limit and a lower limit; wherein when the smoothed linear suppression value is less than the lower limit the attenuation factor is equal to the lower limit and when the smoothed linear suppression value is greater than the upper limit the attenuation factor is equal to the upper limit and when the smoothed linear suppression value is between the upper limit and the lower limit the attenuation factor is equal to the smoothed linear suppression value; and

calculating the transmit signal t[n] according to t[n] = e[n]k.